# Short Communications

*Wilson Bulletin* 117(4):400–402, 2005

## Interspecific Nest Sharing by Red-breasted Nuthatch and Mountain Chickadee

Patrick A. Robinson,[1] Andrea R. Norris,[1] and Kathy Martin[1,2,3]

ABSTRACT.—We report an observation of interspecific nest sharing between Red-breasted Nuthatches (*Sitta canadensis*) and Mountain Chickadees (*Poecile gambeli*) near Williams Lake, British Columbia, Canada. The nest contained two Red-breasted Nuthatch and three Mountain Chickadee nestlings. The nest was attended by a pair of Mountain Chickadees earlier in the observation period and later by an adult female Red-breasted Nuthatch; all five nestlings fledged. Competition for nest sites due to a decrease in cavity availability may have contributed to this occurrence. *Received 5 November 2004, accepted 18 July 2005.*

The advantage of nesting in cavities is often high success, but cavity nesters must compete with other individuals and species to secure this resource. Competition for cavities can limit population densities where cavity availability is low (Brush 1983, Peterson and Gauthier 1985, Holt and Martin 1997). Red-breasted Nuthatches (*Sitta canadensis*) regularly excavate new cavities; however, they also may reuse or renovate existing cavities. Mountain Chickadees (*Poecile gambeli*) primarily reuse existing cavities, but very infrequently renovate or excavate cavities (KM unpubl. data). Both species are common at our study sites in the Williams Lake area of British Columbia, Canada. The area consists of interior Douglas-fir (*Pseudotsuga menziesii*) and lodgepole pine (*Pinus contorta*) interspersed with patches of grassland and stands of quaking aspen (*Populus tremuloides*; Martin and Eadie 1999). Red-breasted Nuthatches and Mountain Chickadees are resident species that compete for similar nest sites, as both prefer mixed forest with a strong conifer component and have similar cavity preferences (Ghalambor and Martin 1999, McCallum et al. 1999, Martin et al. 2004).

Chickadees and nuthatches, along with Downy Woodpeckers (*Picoides pubescens*), comprise a sub-group of small-bodied cavity nesters competing for cavity resources in the nest web (Martin et al. 2004). The rate of extra-group cavity reuse among nuthatches and chickadees is low (17%) relative to the rate of reuse (70%) for primary cavity nesters (Aitken et al. 2002). Thus, high intra-group cavity reuse is the primary source of competition for nest sites among chickadees and nuthatches. If absolute or relative availability of suitable cavities decreased, competition in this group would increase, promoting cavity acquisition strategies, such as usurpation or nest sharing. Steeger and Dulisse (2002) reported increased competition and aggression among cavity nesters in response to changes in the relative abundance of nest sites. Usurpation also occurs in response to decreased nest-site abundance (McCallum et al. 1999). Although not previously reported among Red-breasted Nuthatches and Mountain Chickadees, nest sharing could result from cavity competition if nest initiation by a subordinate pair occurs prior to occupation by a dominant pair, and if the new occupants do not destroy the progeny of the initial pair. In this note, we report a case of interspecific nest sharing, where adults of both species attended the nest, and young of both species were reared to fledging.

### OBSERVATION

In May and June 2004, during the course of our 10-year field investigation of cavity nesters in an area approximately 40 km west of Williams Lake, British Columbia, Canada, we monitored a case of nest sharing involving Mountain Chickadees and Red-breasted Nuthatches (Martin et al. 2004) in a quaking aspen. On 31 May, we observed two adult

[1] Centre for Applied Conservation Research, Faculty of Forestry, Univ. of British Columbia, 2424 Main Mall, Vancouver, BC V6T 1Z4, Canada.

[2] Canadian Wildlife Service, 5421 Robertson Rd., RR1, Delta, BC V4K 3N2, Canada.

[3] Corresponding author; e-mail: kmartin@interchange.ubc.ca

Mountain Chickadees attending the nest and taking insects into the cavity. On 1 June, PAR flushed an adult Mountain Chickadee from the cavity. This was the last detection of adult chickadees at or near the nest. At this time, the cavity was presumed to contain Mountain Chickadee chicks of unknown age. On the next visit (7 June) a female Red-breasted Nuthatch was tending the nest; she entered the cavity with food twice within 5 min. PAR visually inspected the cavity and found five chicks (two nuthatch and three chickadee). On 10 June, the female nuthatch made frequent (approximately once per min) foraging trips from a nearby Douglas-fir tree to the nest. At least two fecal sacs were removed during 6 min of observation. On 11 June, ARN observed all five chicks still in the cavity, and two nuthatch chicks (estimated at 16 days of age) fledged during the observation period. The fledgling nuthatches were seen the next day foraging with the adult nuthatch on and near the nest tree while the cavity still contained three healthy chickadee nestlings. With fewer chicks in the cavity, ARN could see that the nest was lined with fur, typical of chickadee nests, but fresh pitch had been applied to the cavity entrance, which is typical of Red-breasted Nuthatch nests. During this observation, the adult female nuthatch arrived at the cavity without food and vocalized toward the cavity from a nearby branch, apparently encouraging the remaining Mountain Chickadee nestlings to fledge. The female nuthatch then provisioned the chickadee nestlings twice, removing fecal sacs following both visits. On 16 June, the cavity was empty, and with no evidence of predation, we presumed that the chickadees had fledged successfully. Because no birds were banded, subsequent sightings of Red-breasted Nuthatches or Mountain Chickadees in the area could not be associated with this nest.

The study plot where the observation occurred was in a 26-ha stand of mixed deciduous and coniferous forest consisting of 85% Douglas-fir, 4% lodgepole pine, 8% spruce (*Picea* spp.), and 3% quaking aspen. In 2002, we found four Red-breasted Nuthatch nests, and in 2003, we found one nuthatch and five Mountain Chickadee nests. The study plot was selectively harvested in the fall of 2003. The nest tree (recently dead aspen, 30.2 cm dbh) was situated at the edge of the cutblock. In 2004, the first post-cut year, we monitored two Red-breasted Nuthatch and two Mountain Chickadee nests in addition to the shared nest cavity. This was our only observation of interspecific nest sharing and brood rearing in our 10-year study of cavity nesters, during which we monitored 691 nests of small cavity nesters (52 Black-capped Chickadee, *Poecile atricapillus*; 42 Downy Woodpecker; 340 Mountain Chickadee; and 257 Red-breasted Nuthatch).

## DISCUSSION

Although active competition—in the form of aggression before clutch initiation and nest usurpation before and during incubation—is frequently reported (Ghalambor and Martin 1999, McCallum et al. 1999), this is the first record of Mountain Chickadees and Red-breasted Nuthatches successfully rearing their young in a nest attended by both parental species. In our study area, nuthatch nest density more than tripled from 0.03 nests/ha during 1996–2000 to 0.10 nest/ha during 2001–2004; during the same period, chickadee nest density increased from 0.05 to 0.14 nests/ha (KM unpubl. data). This may be a result of regional changes in tree condition and an increased abundance of forest insects (KM unpubl. data). Nuthatches and chickadees prefer dead and decaying aspen trees, which composed <7% of trees on our stands (Martin et al. 2004). Furthermore, nest-site availability decreased at a local scale, due to cutting on the site. Thus, both the absolute and relative availability of nest sites decreased in our study area. These factors, combined with the recent tripling of nuthatch and chickadee populations, may have increased encounter rates and interspecific competition, facilitating the nest-sharing occurrence.

We were able to confirm nest sharing because we visited the nest tree and inspected the cavity visually on multiple occasions. Unfortunately, we did not locate this nest until after the eggs had hatched; thus, we could not determine the circumstances during clutch initiation and incubation. We suspect that Mountain Chickadees initiated the nest because the cavity was lined with fur. In addition, Mountain Chickadees consistently fledge in 21 days (McCallum et al. 1999), whereas Red-breasted

Nuthatches remain in the nest anywhere from 14 to 21 days (Ghalambor and Martin 1999); therefore, the nuthatches could have fledged before the chickadees, even if the nuthatch eggs were laid after the chickadee eggs. Last, we did not observe a male nuthatch at the nest. Given the aggressive nature of male nuthatches and the fact that nuthatch pairs can out-compete Mountain Chickadee pairs (ARN unpubl. data), we suspect the absence of a male nuthatch was an important contributing factor in this occurrence of interspecific nest sharing.

Others have reported interspecific nest sharing where two species laid eggs in the same nest, and in some cases, successfully fledged broods because of cooperative incubation and feeding of nestlings (Skutch 1961, Sundkvist 1979). In Norrbotten, Sweden, a pair of Pied Flycatchers (*Ficedula hypoleuca*) and a female Common Redstart (*Phoenicurus phoenicurus*) shared a nest box and successfully reared the young of both species, despite aggressive encounters between the species during incubation (Sundkvist 1979).

Variation in timing of breeding and dominance can result in cross-species broods. Cavity-nesting Great Tits (*Parus major*) and Blue Tits (*Parus caeruleus*) regularly produce cross-species broods when the earlier-nesting, socially subordinate Blue Tits initiate clutches that are subsequently usurped by the later-nesting, but dominant, Great Tits (Slagsvold 1998). Our nest-sharing observation had some similarities to the tit example, as Mountain Chickadees are subordinate to nuthatches but tend to initiate clutches about 3 days earlier (KM, ARN unpubl. data). Because chickadees do not readily defend their territories against intrusions by nuthatches (ARN unpubl. data), the female nuthatch may not have been deterred by territorial behavior of the chickadee pair.

## ACKNOWLEDGMENTS

Funding and logistics were provided by a Sustainable Forest Management Network for Centres of Excellence and a Natural Sciences and Engineering Research Council of Canada (NSERC) grant to K. Martin. A. R. Norris was supported by an NSERC Industrial Post-graduate Scholarship (sponsored by Tolko Ltd.), Environment Canada's Science Horizons Youth Internship Program, and a Southern Interior Bluebird Trail Society grant. We thank D. A. McCallum and C. K. Ghalambor for discussions about prevalence of this unusual behavior. K. A. Otter and D. A. McCallum made helpful suggestions in the revision of the manuscript.

## LITERATURE CITED

Aitken, K. E. H., K. L. Wiebe, and K. Martin. 2002. Nest-site reuse patterns for a cavity-nesting bird community in interior British Columbia. Auk 119: 391–402.

Brush, T. 1983. Cavity use by secondary cavity-nesting birds and response to manipulations. Condor 85:461–466.

Ghalambor, C. K. and T. E. Martin. 1999. Red-breasted Nuthatch (*Sitta canadensis*). The Birds of North America, no. 459.

Holt, R. F. and K. Martin. 1997. Landscape modification and patch selection: the demography of two secondary cavity nesters colonizing clearcuts. Auk 114:443–455.

Martin, K., K. E. H. Aitken, and K. L. Wiebe. 2004. Nest sites and nest webs for cavity-nesting communities in interior British Columbia, Canada: nest characteristics and niche partitioning. Condor 106:5–19.

Martin, K. and J. M. Eadie. 1999. Nest webs: a community-wide approach to the management and conservation of cavity-nesting forest birds. Forest Ecology and Management 115:243–257.

McCallum, D. A., R. Grundel, and D. L. Dahlsten. 1999. Mountain Chickadee (*Poecile gambeli*). The Birds of North America, no. 453.

Peterson, B. and G. Gauthier. 1985. Nest site use by cavity-nesting birds of the Cariboo Parkland, British Columbia. Wilson Bulletin 97:319–331.

Skutch, A. F. 1961. Helpers among birds. Condor 63: 198–226.

Slagsvold, T. 1998. On the origin and rarity of interspecific nest parasitism in birds. American Naturalist 152:264–272.

Steeger, C. and J. Dulisse. 2002. Characteristics and dynamics of cavity nest trees in southern British Columbia. Proceedings of the Dead Wood in Western Forests Symposium, November 2–4, 1999. Reno, Nevada.

Sundkvist, H. 1979. Pied Flycatcher, *Ficedula hypoleuca*, and Redstart, *Phoenicurus phoenicurus*, breeding in the same nest-box. Vår Fågelvärld 38: 106.